causes no pain whatever; it seems to be, through its constitutional effects, that the tubercles soften from within outwards. I have rubbed it over my own arm, and it did not cause the slightest pain or redness though allowed to remain on all night.

"The emulsion, as I have already explained, is not disagreeable to the palate, and at first it had no well-marked influence upon the digestive system, but when the dose was increased to one drachm twice a day it improved the appetite, and at the same time acted as a mild laxative.

"It also had a distinct diuretic effect, and the larger does (four drachms) twice a day caused several large healthy motions, in fact acted as a powerful diuretic and evacuant."

Limited as has been the duration of this mode of treatment, it has been long enough, Dr. D. says, to show "that leprosy, both tubercular and anæsthetic, can not only be arrested, but the condition of the lepers can be greatly ameliorated, and men here, who had not for years been able to do more than drag out a miserable helpless existence, are now able and willing to work, and every sore is quite healed. In some instances the sores have been healed up for more than three months, and show no tendency to re-open, and these desirable results have been attained simply by the use of gurjon oil and lime-water, substances which are so cheap as to be within the reach of all. No change whatever has been made even in the most minute particular in regard to the diet of the lepers, from what they have been getting for years past, and they get their fish four times a week as usual. I always thought, and still consider, the men under-fed; still I made no change, in order to avoid complications, and to test the gurjon oil on its merits."

SURGICAL PATHOLOGY AND THERAPEUTICS AND OPERATIVE SURGERY.

34. *Intravenous Injection of Chloral into the Veins for the Production of Anæsthesia in Surgical Operations and also for the cure of Tetanus.*—Prof. ORÉ of Bordeaux communicated to the Academy of Sciences, March 2d, a case in which he induced anæsthesia, in a patient on whom he had occasion to excise the calcaneum for necrosis, by the injection of chloral into the veins. One of the radial veins was opened by a capillary trocar, and a solution of chloral, ten grammes to thirty of water, was slowly introduced, and when twelve grammes of the solution had been thrown in, the patient, whose respiration continued perfectly regular, declared that he felt quite overcome with the desire to sleep. However, the injection was slowly continued until twenty-two grammes had entered the vein, and the desire to sleep had become quite irresistible, the patient resembling a corpse in appearance. Not less than ten minutes were required to produce this result. The operation was now proceeded with, and lasted twenty-five minutes. During the whole time the patient continued in the calmest of sleep, not the slightest cry or moan being heard, and the complete immobility of his features sufficiently indicating the utter annihilation of all sensibility. The respiration continued calm and regular, and, what is remarkable, unattended with those momentary signs of asphyxia which had always been observed in the injections when made in animals, and in the two patients so treated for tetanus. After the operation had been completed, the patient would in all probability have continued for hours in this immovable condition, had not a means of arousing him been tried, which had been found so efficacious in animals—namely, the electric current. One of the conductors having been placed over the left side of the neck, and the other over the epigastrium, after the passage of the current, with forcible and rapid intermissions, the patient awoke, and, sitting up in bed, began talking and shaking hands with everybody around him. He declared that he had felt or perceived nothing whatever. This state of ebriety continued for more than an hour, and was

terminated by crying. He then fell into a quiet sleep, and all anæsthetic effect passed away. "Thus, in this way," Professor Oré observes, "we are enabled to graduate the exact dose of the anæsthetic substance, so as to induce insensibility for as long as may be necessary, and then dissipate the effects at will. Is not this a true solution of the problem of anæsthesia?"

M. Oré feels assured that the complete absence of all irritation of the respiratory organs, as contrasted with what he had observed in his experiments, was due to the precautions he had taken. Believing that the slight appearance of asphyxia, attempts at exspuition, etc., which he had observed in animals at the moment of introducing the chloral, were due to the presence of very minute foreign bodies in the solution, he took the precaution of interposing in the syringe employed in this case a sieve which intercepted even the smallest particles.—*L'Union Médicale*, May 12.

Prof. Oré draws the following conclusions (*La Tribune Médicale*, March 22d, 1874):—

1. That intravenous injections are harmless. In the case communicated there was not the slightest trace of phlebitis. There was only a small abscess caused by the penetration of some chloral into the cellular tissue. M. Oré's experiments on animals has taught him that this always occurs, when a large dose is injected subcutaneously. This leads to the important conclusion for the clinician, that the subcutaneous method is the most defective one for the administration of chloral.

2. A second conclusion is the rapid and long insensibility produced by this substance when it is placed in immediate contact with the blood.

3. Hydrate of chloral injected into the veins rapidly arrests tetanic symptoms. Three injections of ten grains each at intervals of 24 hours, produced with sleep complete paralysis of sensibility and motility. M. Oré particularly insists on the circumstance that a small dose of chloral suffices to produce a favourable result.

Finally M. Oré remarks in order that chloral injected into the veins shall arrest tetanic symptoms, it should be administered in a sufficient dose to almost immediately paralyze the reflex action of the spinal cord, and to momentarily completely paralyze motion and sensibility. The dose of ten grammes at each injection appears to him to be sufficient to produce the effect.

Two cases of tetanus treated by intravenous injections of chloral were communicated to the Surgical Society of Paris (*L'Union Médicale*, April 14th), one by M. Cruveilhier, the other by M. Leon Labbé; in both the result was unfortunate. M. Cruveilhier thinks that the treatment may have contributed to the result in his case, but M. Labbé does not admit that such was the fact in his case; he even believes that his patient might have been saved, had it been possible to have performed a greater number of injections of chloral.

Some remarks made at the meeting of the Surgical Society of Paris, unfavourable to intravenous injections, induced Prof. Oré to send a note to that Society, which was read at their meeting on the 13th of May, and which gave rise to an animated discussion.

Prof. Oré stated (*Gaz. Hebdom*, May 22) that in injecting the solution into the veins, he has never observed the slightest symptom which could give rise to any fear of the coagulation of the blood in the vessels. [This does not seem to us to accord with the statement made to the Academy of Medicine on the 10th Feb. last, by M. Personne, that when chloral is added to fresh blood it completely coagulates the latter; and that the fear that such might occur is not without foundation, seems to be proved by a case related by M. Tillaux, which we shall presently notice.]

Prof. Oré further maintained that intravenous injections of chloral should be preferred to chloroform for surgical anæsthesia.

M. Le Fort strongly protested against this last assertion of Prof. Oré, and maintained that to practise surgical anæsthesia by the injection of chloral into the veins was to exhibit a profound contempt for human life. In so grave an affection as tetanus, when all other measures are powerless, an excuse may be found for bold experiments, but to employ intravenous injections of chloral to simply produce anæsthesia was monstrous. In this sentiment MM. Verneuil, Duplay, and all the members of the Society expressed their concurrence.

M. TILLAUX communicated to the Surgical Society of Paris, May 6 (*L'Union Médicale*, May 23), a case of tetanus supervening on the opening of a cyst of the liver. The patient had difficulty in swallowing, followed by true trismus. He prescribed the administration of chloral in divided doses, but the swallowing of each dose excited tetanic convulsions, and the next morning on his visit, the patient appeared to be dying; was unable to swallow, and he determined to employ intravenous injections of chloral. This was immediately done, which at once revived the patient and produced the greatest improvement in his appearance. When M. Tillaux left the patient just previous to coming to the meeting, he entertained the strongest hopes of a successful result, and advanced the following conclusions:—

1. That chloral produces an immediate and marvellous effect in tetanus: 2d. That the method of administering it by intravenous injections does not present the dangers and difficulties with which it has been reproached.

At the next meeting of the Society (*Gaz. Hebdom.*, May 22) M. Tillaux stated that, notwithstanding the injection of 20 grammes of chloral at different times, the patient had died, and that the autopsy showed a coagulum extending through the whole extent of the right cephalic vein and the axillary vein as far as the subclavian vein. In the right auricle a white fibrous clot was found which must have been formed before death, and there was another clot in the left ventricle. The blood had a great tendency to coagulate.

M. Verneuil stated that an Italian surgeon had treated varices by the injection of chloral into the veins, with the hope of thus obtaining a coagulum.

M. Forget maintained that there was great danger in every new therapeutic treatment without first thoroughly studying the agent we employ M. Tillaux's case was a case of experimental surgery. An agent which will succeed in an animal may not succeed in man, and especially a diseased man. A medicament known to produce coagulation of the blood ought not to be injected into the veins for the treatment of tetanus, for it will produce coagulation of the circulating blood.

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35. *Tetanus Treated by Chloral Administered by the Mouth.*—M. CHAUVEL communicated to the Surgical Society of Paris (29th April), two cases of tetanus treated by chloral. One patient took 16 grammes of chloral each day and died at the end of the second day. The other took from the commencement of the disease the same dose every day and died on the third day. In neither case was the chloral of any benefit.

M. VERNEUIL communicated at the same time two cases treated by himself by the same remedy. The first patient took two days after the invasion of the disease 6 grammes of chloral which at once completely arrested the disease, the patient was cured after 25 days treatment. In the second, tetanus supervened ten days after a wound in the head which had almost cicatrized. Ten grammes of chloral were given daily, and the cure was completed in a month. M. V. remarked that it might be objected to his cases that they were chronic; that he thought probable, but he did not think it prudent to wait some days before commencing treatment in order to ascertain whether the progress of the disease was acute or chronic. It may be objected to the administration of chloral by the mouth that some patients cannot swallow. If after administering 15 grammes of chloral no benefit results, M. V. believes it is because the chloral is not pure, or that absorption does not take place from the digestive tube. Finally in some cases the attack is so violent that it is dangerous to wait two, three, or four hours for the effect of chloral administered by the mouth. Some other means of administration must then be sought for. Enemata have sometimes succeeded, but they have the inconvenience of requiring the patient to be moved and consequently tend to bring on the convulsions. Subcutaneous injections are not to be trusted though they may produce temporary relief, and in the treatment of tetanus a very concentrated solution is required, whence result local inflammations. It is easily to be understood then how injections into the veins should have been suggested. The